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## Exploration of body perception and body dissatisfaction in young adults with intellectual disability

**Background:** People with intellectual disability (ID) are more likely to be overweight or obese. Research has shown that body dissatisfaction is a key factor in influencing unhealthy eating behaviour. More evidence is needed relating to how people with ID perceive their bodies in order to provide effectively targeted weight management programmes.

**Aims:** This study aimed to investigate whether people with ID have concepts for underweight, overweight and healthy-weight, and whether they can apply these concepts to themselves. It also aimed to explore body perception bias through comparison of perceived self to independent figure ratings, and body dissatisfaction through perceived-ideal body discrepancy measurement and a series of open-ended questions.

**Method:** Mixed methodology was used to explore body perception and body dissatisfaction in 40 young adults with ID compared to 48 individuals without ID. The Stunkard Figure Rating Scale assessed how ~~participant~~ people would like to look, and ~~their~~ concepts of weight categories.

**Results:** Young adults with ID tend to hold positive beliefs about their bodies. Females with ID were likely to ~~perceive~~ underestimate their body ~~sizes as smaller~~. Individuals with ID understood what is meant by 'overweight', 'healthy-weight' and 'underweight' although these concepts were different to those without ID. Individuals with ID were unable to accurately apply these body size categories to themselves.

**Conclusion:** These findings suggest that individuals with ID will first need support to understand how concepts of body size apply to themselves in order to facilitate weight management.

**Key words:** Body dissatisfaction, body perception, intellectual disability.

## What this paper adds

This paper provides novel evidence of the way in which concepts of weight are understood by people with ID, and how they are applied to the self. Interventions aimed at weight loss or weight control in this client group need to take into account that many people may not perceive themselves as having a problem with their weight, despite having a general concept of what is considered a healthy size. Although this is a problem in the general population also, with figures suggesting that only 75% of those who are overweight self-identify as such (Wardle, 2008), this research suggests the figure to be much higher in the ID population, with significant clinical and practice implications. The results of this study raise this issue of ~~how to~~ the need to sensitively deliver preparatory work for people with ID to help them to recognise that they may need support with weight management, whilst also recognising the positives of a healthy body image.

## 1. Introduction

A growing literature documents the health inequalities experienced by people with Intellectual Disability (ID) compared to the general population (Allerton, Welch, & Emerson, 2011; Emerson, Baines, Allerton, & Welch, 2010). These disparities have been shown in both mortality and morbidity rates (Ouellette-Kuntz, 2005). One particular area of concern is the number of people with ID who are overweight or obese. Prevalence rates vary depending on country but range between 8.5% and 36%, which is consistently higher than rates reported in the general population for the same countries (Grondhuis, & Aman, 2013; Rimmer, Yamaki, Lowry, Wang, & Vogel, 2010; Melville, Hamilton, Hankey, Miller & Boyle, 2007; Stancliffe, Lakin, Larson, Engler, Bershadsky, Taub, & Ticha, 2011).

Higher rates of being overweight or obese in people with ID have been suggested to be caused by multiple factors. These include biological/genetic considerations such as a higher prevalence of low metabolic rate and hypothyroidism, particularly in people with Down's syndrome (Bhamik et al, 2008), increased likelihood of taking antipsychotic medication where weight gain might be a side-effect (Newcomer, 2005), and barriers to maintaining a healthy lifestyle such as lack of access to leisure facilities

due to transport issues, staff shortages and limited income (Messent et al, 1999). People with ID have also been found to be more likely to have poor dietary habits such as high consumption of sugary foods and low consumption of fruit, vegetables and fibre (Biswas et al, 2010).

Being overweight or obese not only reduces an individual's quality of life (Hughes, Farewell, Harris, & Reilly, 2006) but is also associated with a range of secondary health problems such as coronary heart disease, type 2 diabetes, breast and colon cancers, gall stones and sleep apnoea (Craig & Mindell, 2011). This demonstrates the huge clinical importance of understanding eating behaviour and weight management in people with ID.

Body dissatisfaction is a key factor in influencing an individual's eating behaviour (Ogden, 2012) and determining whether an individual is motivated to lose weight (Johnson, & Wardle, 2005; Neumark-Sztainer, Paxton, Hannan, Haines, & Story, 2006; Stice, 2002; Stice & Shaw, 2002). Higher levels of body dissatisfaction are often associated with unhealthy eating patterns, including higher levels of restrained ~~eating, and~~ emotional eating (Johnson, & Wardle, 2005) ~~and higher levels of~~ dieting, ~~and~~ binge eating, ~~as well as~~ ~~and~~ reduced fruit and vegetable intake (Neumark-Sztainer, Paxton, Hannan, Haines, & Story, 2006).

Body dissatisfaction is conceptualised in several different ways. Firstly, it can be thought of as a distorted body size estimation, where an individual perceives their body to be different from its actual size (body perception bias). This has been documented consistently in the literature relating to males and females without ID (Cohane, & Pope, 2001; Gila, Castro, Toro & Salameiro, 1998) and is greater in individuals with an eating disorder (Gila et al, 1998). Secondly, body dissatisfaction refers to having negative feelings and thoughts about one's own body such as wishing to be thinner or wishing to have more muscles (Cohane, & Pope, 2001, Gila et al., 1998). Thirdly, body dissatisfaction describes the discrepancy between how one perceives oneself and how one would ideally like to be (perceived-ideal discrepancy). Males often report a desire to be larger than they are and females report the wish to be

thinner (Silberstein, Striegel-Moore, Timko & Rodin, 1988). This perceived-ideal discrepancy is considered a key contributor to an individual's eating behaviour and motivation to change their weight.

To date there is very limited literature regarding body dissatisfaction in people with ID. Early studies suggest that it is possible to improve body image in people with ID (Franklin, 1979) and that self-concept may be linked to gender (with females demonstrating a more positive self-concept), and can be predicted by the way in which people pictorially represent themselves (Ottenbacher, 1981). The latter study acknowledged however that conflicting outcomes had been reported in the literature regarding the influence of gender and that other variables relating to social and environmental context might act as confounds. A recent review of case studies relating to body image in people with disabilities and eating disorders identified 6 studies exploring anorexia nervosa in this population, and also suggested that both immediate social context and experiences, and the social identity of disability itself may contribute to negative body image and subsequent eating disorders (Cicimil and Eli, 2014). However, there continues to be a lack of literature specifically investigating relationships between body perceptions and biases in this population.

The Stunkard Figure Rating Scale (SFRS; Stunkard, Sørensen, & Schulsinger, 1983) can be used to assess body dissatisfaction. This scale depicts drawings of nine male and nine female bodies, ranging in size from underweight to obese. A perceived-ideal discrepancy can be determined by comparing the figure that a participant believes represents their body to the figure that represents how they would like to look. The SFRS has been shown to have strong psychometric properties when used with the general population, with good test-retest reliability and moderate correlation with other measures of body dissatisfaction. It has not, to our knowledge, been used with people with ID (Stunkard, 2000; Thompson and Altabe, 1991).

~~Research in other areas has shown that people with ID sometimes have difficulty applying generalised rules to themselves. For example, when asked "does everyone die?", 71% of people with ID correctly answered "yes" whereas only 42% answered "yes" to the question "will you die" and 55% of people answered "no"~~

~~(McEvoy, 1989). Therefore, it would be interesting to know whether this sort of pattern is also apparent when referring to body image. For example, are people with ID able to identify an underweight, overweight and healthy body size but then unable to apply these categories accurately to themselves?~~

Based on the gaps in the literature identified above, the aims of this research were as follows;

1. Explore the psychometric properties of the SFRS when used with people with ID.
2. Investigate whether people with ID have a concept for what is underweight, overweight and a healthy-weight and whether they can accurately apply these concepts to themselves.
3. Investigate whether people with ID have a body perception bias and compare this to people without ID.
4. Investigate whether people with ID report a perceived-ideal body discrepancy and compare this to people without ID.
5. Explore the themes of body dissatisfaction in people with ID.

## **2. Material and Methods**

A mixed method design was used. Statistical Package for the Social Sciences (IBM SPSS Statistics, 22) was used for the quantitative analyses. All assumptions for parametric analyses were tested and non-parametric tests were used where appropriate. Content analysis was employed to further explore the themes of body dissatisfaction in people with ID. This method integrates qualitative and quantitative methodology. Content analysis was selected as this is appropriate to use in an inductive manner to build knowledge and understanding where no previous research has been conducted (Elo & Kyngäs, 2008). In this study, participants' responses were analysed to provide a preliminary description of body dissatisfaction in people with intellectual disability. Furthermore, content analysis was particularly appropriate for this study as the categorised text could be summarised and then compared between the

separate interview questions. This provided an opportunity to explore how participants perceived their own bodies compared to how they believed others perceived them.

Ethical approval for this project was granted by the University of Bath Ethics committee.

2.1 Measures

Weight, height and body mass index (BMI).

Each participant’s BMI was calculated using weight and height and then categorised into healthy, underweight, overweight or obese according to Body Mass Index Classifications (World Health Organisation, 2015; table 1)

Table 1  
*BMI categories according to the World Health Organisation Classification system.*

BMI	Category
<18.5	Underweight
18.5-24.9	Healthy weight
25.0-29.9	Overweight
>30.0	Obese

Background information questionnaire.

Background information was collected including age, gender, ethnic origin and whether or not the participant had a physical disability. It is possible that these personal characteristics influence an individual’s perceptions and attitudes towards their body (Slade, 1994). Therefore, this information was collected so that the influence of these factors could be considered during data analysis.

The ~~SFRS~~Stunkard Figure Rating Scale (SFRS)~~et al, (1983).~~

Permission to use the SFRS ([Stunkard et al., 1983](#)) was granted by the Director of the Center for Weight and Eating Disorders, where the scale was developed. The SFRS was used in this study to assess participants' concept for different weight categories (underweight, overweight and healthy-weight), participants' perceived-ideal body discrepancy and participants' body perception bias. Participants used the figure pictures that were congruent with their sex. The validity of the SFRS is good, with a correlation coefficients of 0.67 between the SFRS and BMI and a correlation coefficient of 0.59 between the SFRS and weight (Stunkard, 2000). These correlation coefficients are high compared to those recorded for similar measures (Stunkard, 2000). The SFRS has also been shown to provide a valid representation of people's body size when measured by objective unbiased observers (Cardinal, Kaciroti & Lumeng, 2006). This study will be the first to document the use of this measure with people with ID.

## 2.2 Recruitment and consent

Eleven colleges that offered courses to young adults with ID and students without ID were approached. The course directors were contacted via email and/or phone and invited to take part in the study. They were provided with a rationale for the study and a brief description of the methodology. Two colleges (18%) opted to take part.

Private rooms within the colleges were used for data collection. Each student was greeted by the secondary researcher who went through the information sheet and gained consent. In accordance with the Mental Capacity Act (Department of Health, 2005), potential participants were given all practical help available to enable them to make an informed choice whether or not to take part in the study. All potential participants with ID were asked a series of questions to check their comprehension to ensure that they were able to provide informed consent. Participants were required to correctly answer every question in order to be included in the study. Although the length of time was not assessed formally, this process lasted between five and 30 minutes for each participant. Table 2 shows the questions included in the



comprehension checklist. 14% of potential participants were deemed to lack capacity to provide informed consent so were therefore not included in the study.

Table 2

*Comprehension checklist for informed consent*

	UNDERSTANDING DEMONSTRATED	
	Yes	No
What is the study about?		
• Mentions how he/she thinks about their body		
What will you be asked to do?		
• Measure weight		
• Answer questions		
Are you allowed to say no to taking part?		
Can you change your mind and stop taking part if you want to?		
Do you have to answer any questions that you don't want to?		
Will your information be kept private so that other people don't know your answers?		
We will write about our findings in a journal		

2.3 Participants

40 young adults with ID and 48 individuals without ID took part in this study. All participants were aged between 16 and 25, which represents emerging adulthood (Arnett, 2000) and were attending an educational course within the South-West of England. IQ was not formally assessed as the demands of this process on the individual was not felt to be commensurate with the benefits of participation. However, the young adults with ID were attending courses specifically designed for people with mild ID (estimated IQ range 55-70). The control group were attending higher education college courses and were best estimated to have IQs within the average range. Sample matching according to BMI was unfortunately not achieved. This was due to access to a limited sample which was representative of the higher figures of people with ID within the overweight and obese categories.

Table 3 shows participants' demographic information. Participants with a physical disability were not included in any analysis which required measures of height and weight as it was not possible to obtain the equipment or support necessary to collect this information.

## **2.4 Procedure**

Participants were asked questions to assess their concepts of weight in the following order: 'Which of the figures do you think looks like someone who is underweight...a healthy weight...overweight?' They were then asked, 'which of the figures do you think is most like your body?' and 'which of the figures would you most like to look like?', in order to measure accuracy of self-rating and perceived-ideal discrepancy.

Participants with ID were also asked 5 open-ended questions about their body satisfaction and asked to assess whether they rated themselves as underweight, a healthy weight or overweight.

Table 3

*Demographic characteristics of the ID group and the control group. Statistical analysis has been conducted to determine whether there are any significant differences between the two groups.*

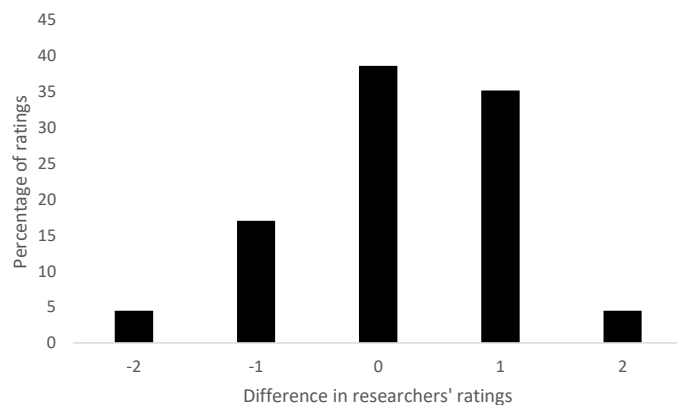
		ID group	Control group	Mann Whitney U/ Likelihood Ratio/ X <sup>2</sup>	p value
N		40	48		
WHO BMI category (%)	Underweight	15.4	10.4	13.77	<0.01
	Healthy weight	30.8	68.8		
	Overweight	28.2	14.6		
	Obese	25.6	6.3		
Mean age (years) (SD)		20.3 (2.4)	17.8 (1.5)	284.0	<0.01
Gender (% male)		50	57.5	0.49	0.48
Ethnicity (%)	White British	82.5	52.1	21.26	=0.01
	White other	0	6.3		
	Mixed Ethnicity	0	14.6		
	Indian	5.0	4.2		
	Black	12.5	18.8		
	Arab	0	4.2		

## 1. Results

### 3.1 Validating the SFRS for use with people with ID

#### Inter-rater reliability.

The psychometric properties of the SFRS were assessed. Two researchers independently rated the participants on the SFRS according to which figure they thought was most representative of the participant's body shape. The primary researcher was a final year Clinical Psychologist in Training with a previous PhD completed within the intellectual disability field. The secondary researcher was an Assistant Psychologist working within a Community Learning Disability Team. The researchers' ratings were compared using Cohen's Kappa. The results indicated that there was a fair and significant level of agreement between the two raters for every item of the SFRS (Kappa= .284,  $p<0.01$ ). A closer inspection of the data indicated that, although the ratings were significantly correlated, one researcher appeared to consistently score higher than the other, demonstrating a possible bias in one or both researchers (figure 1).



*Figure 1.* The difference between the two researchers' ratings on the 88 participants.

Research indicates that figure three on the SFRS represents an underweight individual (Bulik, Wade, Heath, Martin, Stunkard, et al., 2001, Lo, Ho, Mak, & Lam, 2012), figure four a healthy-weight (Must, Phillips, Stunkard & Naumova, 2002), figure 5 an overweight individual (Lo et al., 2012, Must, et al., 2002), and figures 6-7 obese individuals (Bulik et al., 2001, Must et al., 2002). When the scores provided by each rater were grouped into these categories, the agreement between the two raters

increased further to a moderate level of agreement (Kappa- 0.50,  $p < 0.01$ ) (Landis & Kock, 1977). This is in line with the work completed by Cardinal et al. (2006), which showed that the SFRS can be used by an objective observer to provide an accurate rating of body size.

### **3.2 Accuracy of using observers' rating on the SFRS to indicate BMI and BMI category.**

Spearman's correlation coefficients were calculated between the mean of the two researcher's SFRS ratings and the participants' BMI. There was a strong, positive correlation between mean researcher SFRS rating and BMI in people with ID ( $r_s(37) = .96, p < 0.01$ ) and those without ID ( $r_s(46) = .86, p < 0.01$ ). Fisher's exact tests (two tailed) were used to assess the association between researchers' mean ratings that were categorised according to the wider research literature (Bulik et al., 2001; Lo et al., 2012; Must et al., 2002) and the BMI classification index (WHO, 2015). Results indicated a significant association between researcher and WHO BMI classification for both the control ( $p < 0.01$ ) and the ID groups ( $p < 0.01$ ).

### **3.3 Validity of SFRS when used by individuals with ID.**

To assess whether the participant understood the general logic of the SFRS, results were examined to check that individuals rated their concept of an overweight figure as larger (i.e. a higher score on the SFRS) than their concept of an underweight figure. All participants in the control group and 33/40 (82.5%) of participants in the ID group were able to answer correctly. Results are reported separately for the whole group of participants with ID and the subgroup of individuals who answered this screening question correctly.

Fisher's exact tests were used to compare the category of self-perceived body image, as reported by the participant (i.e., the BMI category of the figure they selected as representing themselves according to the research literature; four levels: underweight (figures one- three), healthy weight (figure four), overweight (figure five)

and obese (figures 6 and above), to their BMI category (WHO, 2015; four levels: underweight, healthy weight, overweight and obese). Results indicated that ratings made by the control group were significantly associated with their actual BMI category ( $p < 0.01$ ). Ratings made by the whole ID group were not significantly associated with their actual BMI category ( $p = 0.12$ ) whereas an analysis of the subgroup of participants with ID demonstrated that body ratings were significantly associated with BMI category ( $p = 0.01$ ).

### **3.4 Do people with ID have a concept for underweight, overweight and healthy weight?**

Participants were asked to indicate on the SFRS which figure they believed represents an underweight, overweight and healthy-weight individual. Wilcoxon signed ranks tests were conducted to look at within-group median scores. The lowest figure rating for an overweight individual was compared to the highest figure rating for a healthy individual and the lowest figure rating for a healthy individual was compared to the highest rating for an underweight body. Participants in the control group demonstrated clear categories for each of these body types, with significant differences between underweight (Median= 2) and healthy ratings (Median= 4) ( $Z = -6.09, p < 0.01$ ), and healthy-weight (Median = 4) and overweight ratings (Median= 7) ( $Z = -6.12, p < 0.01$ ).

The Wilcoxon signed rank test results indicated that individuals with ID could distinguished between healthy-weight (Median= 4) and overweight (Median= 8) (whole group:  $Z = -5.23, p < 0.01$ ; subgroup:  $Z = -4.81, p < 0.01$ ), but there was not a significant difference found between healthy-weight (Median= 4) and underweight (Median= 2) (whole group:  $Z = -0.18, p = 0.86$ ; subgroup:  $Z = -1.26, p = 0.21$ ). This was investigated further by comparing the mean ratings of underweight, overweight and healthy-weight by participants with ID (see Table 4). These ratings suggest that people with ID correctly conceptualise underweight as smaller than healthy-weight, and healthy-weight as smaller than overweight. Furthermore, the mean ratings associated with each of these categories provided by people with ID more closely reflect the ratings previously reported in the literature compared to the control group (Bulik et

al., 2001; Lo et al., 2012; Must et al., 2002) suggesting that people with ID do hold concepts for underweight, healthy weight and overweight.

Table 4

*Mean SFRS figure ratings for underweight, healthy-weight and overweight.*

	Mean highest underweight figure	Mean lowest healthy weight figure	Mean highest healthy weight figure	Mean lowest overweight figure
Control group	1.81	3.83	4.13	6.92
Subgroup ID group	2.64	3.33	3.61	7.64
ID group	3.83	3.73	4.0	7.78

### 3.5 Applying concepts of underweight, overweight and healthy weight to oneself

To assess whether people with ID apply generalised beliefs about body size to themselves, their verbal response for their perceived body size (i.e. if they stated they were underweight, overweight or healthy-weight) was applied to their picture rating of themselves. This was then compared to the ratings they gave when discussing body sizes in general. For example, if a participant verbally reported that they were a 'healthy-weight' and then indicated that they perceived themselves to be the number seven on the SFRS, the number seven would then be compared to the number that the participant provided when asked the general question 'which picture represents a healthy body'. Spearman's correlation coefficients were calculated between self-perceived body ratings and the rating given in general for the body shape the participant identified as (i.e. underweight, overweight or healthy weight). There was a non-significant correlation for both the whole group and subgroup of participants with ID (whole group:  $r_s(35) = 0.03$   $p = 0.87$ , subgroup:  $r_s(31) = 0.06$   $p = 0.73$ ). This suggests that individuals with ID do not apply generalised rules for body size to themselves.

### 3.6 Body perception bias in people with ID compared to people without ID

Using the SFRS, participants were asked to indicate which figure best represented their body. This was compared to the mean researchers' ratings of the

participant's body shape to provide a measure of body-perception bias. Wilcoxon signed rank tests indicated that individuals in the control group did not display a body perception bias ( $Z = -1.46, p = 0.15$ ), which remained true even when the group was split according to gender (males:  $Z = -0.71, p = 0.48$ ; females:  $Z = -1.48, p = 0.14$ ).

People with ID demonstrate a marginal body perception bias when the group is analysed as a whole ( $Z = -1.99, p = 0.046$ ) but not when only the subgroup data was analysed ( $Z = -1.90, p = 0.06$ ). When split according to gender for the whole group, the body perception bias was apparent in the females ( $Z = -2.73, p = 0.01$ ) but not the males ( $Z = -0.02, p = 0.99$ ) and the same was found in the subgroup of participants with ID (females:  $Z = -2.39, p = 0.02$ ; males:  $Z = -0.20, p = 0.84$ ). In both the whole group and subgroup of participants with ID, females ~~were found to be perceived~~ed themselves as significantly smaller than researchers had perceived them to be.

### **3.7 Perceived-ideal body discrepancy in people with ID compared to people without ID**

Participants were asked to rate which figure represented their ideal self-image. The difference between perceived and ideal body provided a measure of perceived-ideal body discrepancy. A Wilcoxon Signed-rank test showed a significant difference between perceived body (median=4, mean=4.04, range=1-7) and ideal body (median=4, mean=3.70, range=2-5) in the control group ( $Z = -2.29, p < 0.05$ ). When split according to gender, the males did not show a significant difference between their perceived (median=4, mean=3.84, range=1-7) and ideal body shape (median= 4, mean=3.70, range= 3-5;  $Z=0.53, p = 0.56$ ), whereas the females perceived body shape (median=4, mean=4.24, range=3-7) was significantly larger than their ideal body shape (median=4, mean=3.46, range= 2-5,  $Z=-2.72, p = 0.01$ ).

The difference between perceived self (whole group: median =4.0, mean=4.06, range= 1-8; subgroup: median=4, range=1-8) and ideal self (whole group: median= 3.5, mean=3.51, range= 1-8; subgroup: median=4, range=1-8) was not significant in people with ID (whole group:  $Z = -0.98, p = 0.33$ ; subgroup:  $Z = -1.15, p = 0.25$ ). This



was also the case when the results were split according to gender (whole group male: perceived mean=4.25, ideal mean=3.82,  $Z=-0.46$ ,  $p=0.65$ ; whole group female: perceived mean=3.81, ideal mean=3.22,  $Z=-0.57$ ,  $p=0.57$ ; subgroup male;  $Z=-0.87$ ,  $p=0.39$  Subgroup female  $Z=-0.63$ ,  $p=0.53$ ). This suggests that people with ID have lower levels of perceived-ideal body discrepancy compared to their peers without ID.

### **3.8 Exploring the themes of body dissatisfaction in people with ID.**

Participants with ID were asked 5 open questions relating to how they feel about their bodies (see Table 5 for full list of questions in chronological order). The answers resulting from these questions were analysed using content analysis to examine trends and relationships. The primary and secondary researchers independently completed the content analysis on the entirety of the data and then met to establish a consensus in the themes. There was 100% agreement of the themes identified by the two researchers although in question two, differences were identified between whether these were categorised as major themes or subthemes. The primary researcher categorised the data into the major themes 'smaller' (subthemes: 'thinner' and 'weigh less') and 'bigger' (subthemes: 'weigh more', 'stronger/muscles' and 'taller'). In comparison, the secondary researcher grouped the themes into 'weight' (subthemes: 'weight more', 'weigh less' and 'thinner'), 'height' (subtheme: 'taller') and 'strength'. Through discussion, the primary researcher's categorisations were selected as these were more closely related to later themes identified in question five, meaning comparisons between the two questions would be easier. Table 5 shows the major and minor themes resulting from this analysis.

Table 5

*The major themes and subthemes identified through content analysis exploring body perceptions in young adults with intellectual disability (n= 40).*

	Major theme (Number of responses that fell into theme)	Subtheme (Number of responses that fell into theme)
Question 1: How do you feel about the way you look?	Positive (22)	Clean (1) Strong(1) Don't know (2)
	Neutral (15)	
	Negative (2)	
Question 2: Is there anything you would like to change about your body?	No (22)	Don't know (3) No identified change (19)
	Bigger (7)	Weigh more (3) Strong/muscles (3) Taller (1)
	Smaller (8)	Thinner (4) Weigh less (4)
	Healthy (1)	
Question 3: Why would you want to change that about your body?	Primary change (8)	Appearance (2) Health (6)
	Secondary reward (1)	Start new activity/ get something new(1)
	Circular- method to get slim (3)	
	Perception of others (3)	Romantic other (1) Bullies (2)
Question 4: What do other people think about the way you look?	Positive (14)	
	Neutral (20)	Don't know (10) Concrete statement about appearance (4)
	Negative (2)	
Question 5: Why might other people want to change the way they look?	Perception of others (3)	Romantic other (1) Bullies (1)
	Bigger (3)	
	Smaller (3)	
	Don't know (10)	
	Comparison to others (1)	
	Dissatisfaction with self (7)	
	Health (5)	

The results from the first question show that the largest proportion of participants with ID viewed their bodies favourably (55%), responding with statements such as “good”, “brilliant” and “awesome”. 37.5% of participants provided neutral answers when asked how they viewed their bodies, such as “fine” and “alright”. Only two participants (5%) reported a negative view of their bodies, both stating “I don’t like it”.

When asked if there is anything that they would like to change about their bodies (question two), 55% of respondents answered that there was nothing they wanted to change, 64% of whom were the participants who responded that they were happy with their bodies. The most common identified change, endorsed by 20% of participants related to wanting a smaller body, either “being slimmer” or to “lose weight”. 17.5% of participants stated that they wanted a bigger body. This divided into further subthemes including wanting bigger muscles/being stronger, wanting to be taller and wanting to increase in weight.

When asked why they would like to change their bodies in that way, the most common responses could be themed as a primary reward including a change in appearance, which was suggested by 5% of participants, such as “not to have a belly” and a change in health, which was given as a reason by 15% of respondents. Answers coded according to this theme included “to be healthier” and “because I’m getting out of breath and it has caused damage to my knees”. The perceptions of others were also cited as a reason by 7.5% of participants, including the views of romantic others; “to go on a TV show like *take me out* when you’re single” or “for my girlfriend”, and the views of bullies; “because I’ve been getting picked on” and “so if someone big came up to me, I would be tough and could fight them off”. Finally, a number of participants provided answers that appeared to give details about how to achieve the desired change, rather than a reason why. For example, one participant responded; “healthy food, stop eating bad food” and another said “so I can get more active”.

The forth question related to what the participant thought other people felt about their appearance. The themes to this answer mirrored those from the first question; either falling into positive (35%), negative (5%) or neutral (50%). Positive answers included statements such as “look cool”, “amazing” and “beautiful” and negative answers included “they say I look ill” and

“some horrible”. Many of the participants who believed that others viewed them in a positive way, also felt positive about themselves (11/14; 79%) whereas this was not the case for the participants who either viewed themselves in a negative way or felt that other people viewed them negatively. The largest proportion of participants responded in a neutral way, which also included answering “I don’t know”, which accounted for half of the neutral answers.

The final question asked participants to think about other people and state why others may choose to change something about their bodies. The most common answer was “I don’t know”, which accounted for 25% of responses. Second to this was the suggestion that the person was dissatisfied with their appearance for some reason (17.5%), such as “because they’re not happy with how they look” or “because they don’t like how they look – just their personality”. As with question two, there were also themes around wanting to be smaller (7.5%) and bigger (7.5%). In both of these cases, there was one participant (2.5%) whose response from question two directly matched their response to question five. Another theme to be identified from the fifth question was citing health as a reason for another person wanting to change their body (12.5%). These responses included answers such as “not healthy”, “because they don’t want to get obese” and “so they keep fit”.

## 2. Discussion

### 4.1 Overview.

The aim of this research was to provide an initial investigation into body perception and body dissatisfaction in people with ID, in order to inform this aspect of the developmental, cognitive and weight concern model of eating behaviour for this population group. ~~Content analysis was used to explore the themes reported by individuals with ID about how they feel about their bodies.~~ A range of quantitative analyses were conducted to test the psychometric properties of the SFRS when used with people with ID and to establish whether people with ID experience body perception bias and ideal-self discrepancy. Content analysis was used to further explore the themes reported by individuals with ID about how they feel about their bodies.

## 4.2 Validating the SFRS.

The SFRS is a widely used tool for assessing body perception and body dissatisfaction. Before this study, it had not been used with people with ID. The results of this study suggest that the SFRS can be used as a reliable and valid measure of BMI with people in the general population when ratings are made by an objective observer or by the individual themselves. This is only the case with people with ID if they have demonstrated a basic understanding of the SFRS first. This can be assessed by checking if the individual understands that an overweight body is indicated by a higher number figure compared to an underweight body. Interestingly, a closer inspection of the ~~entire data set data~~ suggested that, although the raters demonstrated a relational congruence (i.e. if presented with two bodies, they would order them in the same way) one rater would frequently and consistently rate people higher on the SFRS compared to the second rater. This suggests that objective observers may be susceptible to their own biases when rating other people. In order to maximise the validity of the SFRS, it would be advisable to have a period of training where raters are informed of participants' BMIs in order to identify their own perception biases and learn to counter the influence of these beliefs.

## 4.3 ~~Having a~~ Concepts of weight and body perceptions in people with ID ~~for underweight, healthy-weight and overweight.~~

By using the SFRS, it was demonstrated that people with ID do seem to have a concept for underweight, healthy-weight and overweight although this appears qualitatively different to how their peers without ID perceive these body categories. The results of this study suggest that people without ID have a more extreme view of underweight compared to people with ID. Also, people with ID appear to accept smaller body sizes as healthy compared to their peers without ID. Furthermore, people with ID appear to conceptualise overweight as larger than people without ID. Further research is warranted to investigate the cause and implications of these body shape conceptualisations. This finding may suggest that people with ID are less susceptible to societal pressures, which promote thinness and discourage being overweight, resulting in a less extreme and a more accurate view of what is underweight. This is similar to some findings in populations of people with sensory and physical disabilities, where interactions with immediate social networks (e.g. family, peers, carers and healthcare professionals) were found to be mediators to societal messages (Cicmil and Eli, 2014). In addition, the finding that people with ID might conceptualise overweight as bigger than those

without ID conceptualise this may reflect differences in the prevalence of overweightness and obesity in people with ID, which may skew what is perceived as 'normal' and therefore what is healthy versus overweight. Taken together, it is therefore important to consider how the systemic context around the individual might influence their body dissatisfaction, and whether interventions might need to go further than a focussing on shifting the individual's perceptions and behaviour.

#### **~~4.4 Applying the concept of underweight, healthy weight and overweight to oneself.~~**

Even though people with ID understand the concept of underweight, healthy\_weight and overweight in general terms, they did not ~~appear to~~ apply these categories accurately to themselves. This is an important finding when designing weight management programmes as it may be necessary to first ensure that the individual recognises their weight status before supporting them to make healthy choices. For example, if an individual learns the importance of calorie controlled diet for overweight people, they would then need to identify themselves as being overweight to recognise the importance of applying this health choice to themselves.

The SFRS could prove a useful assessment tool or pre/post measure in this context.

Females with ID in this study significantly underestimated their body size. This contradicts what would be expected according to the extant literature, which states that females typically perceive themselves to be larger than they are (Cohane, & Pope, 2001; Gilaet al., 1998). One possibility is that females with ID were answering in accordance to what they thought the researcher wanted to hear (i.e. demand characteristics). However, this would rely on females with ID predicting that there was a negative connotation to being larger, which is not reflected in the perceived-ideal body discrepancy or qualitative findings in this study.

Misperceptions of own body size in people with ID could again relate to the significance of messages from people's immediate social networks, where people with ID may be protected from negative discussions about their appearance, perhaps to prevent invoking negative emotional or behavioural responses. They may therefore underestimate their own weight based on the views of others. People may also inaccurately estimate their body size related to others due to an inability to generalise rules or concepts to themselves. Further research is needed to explore this phenomenon.

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~~In addition, this~~In addition, this study did not look at whether people with ID understood the consequences of being overweight, which may represent a significant contributory factor in motivation to change behaviour. Further research looking specifically at weight-related knowledge in people with ID (particularly those who fall outside of the 'healthy weight' category), would provide important clinical insight.

#### **4.5 Body perception bias.**

~~Individuals in the control group were able to accurately recognise their body shape on the SFRS. However, females with ID significantly underestimated their body size. This contradicts what would be expected according to the extant literature, which states that females typically perceive themselves to be larger than they are (Cohane, & Pope, 2001; Gilaet al., 1998). One possibility is that females were answering in accordance to what they thought the researcher wanted to hear (i.e. demand characteristics) although, if this was the case, you would expect the same result for the male participants with ID. However, this would rely on females with ID predicting that there was a negative connotation to being larger, which is not reflected in the perceived ideal body discrepancy or qualitative findings in this study. Further research is needed to explore this area in more detail to establish what the likely cause of this finding is. Again, this could relate to messages from people's immediate social networks, where people with ID may be protected from negative discussions about their appearance, perhaps to prevent invoking negative emotional or behavioural responses. Understanding body perception bias in people with ID is vital for informing weight management groups, especially for females with ID.~~

#### **4.6 Perceived ideal body discrepancy.**

Individuals with ID do not express the same perceived-ideal body discrepancy as is seen in the general population. This may link to lower levels of distress associated with being unhappy with one's own body, and also protect people from unhealthy eating practices such as bingeing and emotional eating (Johnson, & Wardle, 2005; Neumark-Sztainer et al, 2006). However, this may also remove a motivational factor for making positive changes if an individual is not a healthy weight.

#### ~~4.7 Content analysis of body dissatisfaction in people with ID.~~

The content analysis suggested that the majority of people with ID are satisfied with their bodies and believed that others also perceive their bodies favourably. This further supports the notion that individuals with ID may lack the motivational influence of feeling negatively towards themselves or believing that others are viewing them critically.

#### **4.48 Limitations and future research directions.**

There were a number of limitation with this study that should be considered when interpreting the data. First, the order of the questions relating to body size categories (i.e. which body is overweight, underweight or healthy weight) was not randomised, and was presented consistently for all participants in both categories. It may be the case that there was an order effect to results that were obtained. Also, participants were asked these questions after being asked to rate their perceived body on the SFRS. Participants may have altered their later answers based on previous responses, for instance, if they did not want to be seen to identifying as underweight or overweight.

A further limitation was that, due to the nature of the SFRS, individuals who positioned themselves on the far ends of the scale were restricted in their responses for any perceived-ideal body discrepancy. For example, if an individual rated themselves as a '1', they would be unable to provide a response that would indicate they would want to be smaller than they currently view themselves to be. The ethnic diversity of this study was limited and the sample size was too small to look for any differences between people from different cultural backgrounds. However, although some research suggests differences in body dissatisfaction according to ethnicity (Mikolajczyk et al 2012; Robinson et al., 1996) a meta-analysis by Grabe and Hyde (2006) found very little evidence to support this view, therefore it is unclear whether this represents a significant limitation. BMI was also not matched between groups. Further studies with matched BMI ~~may would provide~~ more detailed findings regarding stratification of body dissatisfaction and perceptions according to this variable. In addition, it is recommended that future research looks further at IQ as a potential variable in exploring body dissatisfaction. This could establish the extent of variance in body dissatisfaction that might be explained by cognitive difficulties as opposed to immediate social influence as discussed above.



## 5. Conclusions

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### 5.1 Clinical implications.

This research is an important step in exploring the factors that may make healthy weight management interventions particularly difficult for people with ID. To promote healthy choices, females need to be educated to perceive themselves accurately, rather than ~~being influenced by their bias to view themselves as smaller~~ viewing themselves as smaller than they are. Both males and females need support to understand how to apply body categories to themselves. Only through integration of these levels of understanding could an individual progress to a point of making the correct health choices for their body. Even then, it may be difficult to instil motivation for change as one of the most common drives for weight management is a perceived-ideal body discrepancy (Johnson, & Wardle, 2005; Neumark-Sztainer et al., 2006; Stice, 2002; Stice & Shaw, 2002). This is a problem in the general population also, with figures suggesting that only 75% of those who are overweight self-identify ~~ing~~ as such (Wardle, 2008). This research suggests the figure to be even higher and therefore of greater significance in the ID population. However, consideration must be given to the way in which interventions highlight to people with ID that they are overweight. ~~In addition,~~ ~~†~~ There are case study examples in the literature where people with ID have developed eating disorders (Cottrell and Crisp, 1984; Dymek and le Grange, 2002), with negative messages from those around them seemingly at least one contributory factor towards this. It should not be a target of interventions to promote body dissatisfaction, but, if body dissatisfaction is not present, interventions need to focus on building alternative sources of motivation for healthy weight management. ~~R~~ ~~†~~ rather than focusing solely on an individual's classification as overweight or obese. Such, interventions should ~~target-include~~ education programmes that look at healthy eating and exercise as part of a healthy lifestyle, whilst also monitoring and supporting self-esteem and reinforcing success. People may then be supported to more autonomously manage their lifestyle and identify where they can make positive changes, which would be more likely to result in sustained change.

### 5.2 Wider research implications.

This exploratory study identifies a number of interesting differences between body dissatisfaction in people with ID compared to those without. It is important that replication studies are conducted to strengthen the confidence that can be held in relation to these findings.

This study begins to address the relative dearth of research regarding body perception and dissatisfaction in people with ID compared to the general population. It builds on the review reported by Cicmil and Eli (2014) by utilising a mixed-methods design to specifically look at the relationship between ideal and perceived self in the ID population. It also adds to these findings in terms of the potential greater impact of immediate vs. societal messages about body image.

One of the reasons why there may be such a lack of research with this population group is because of the difficulties with recruitment and ensuring that participants are able to provide informed consent to take part. This study uses a comprehension checklist as a unique approach to assessing capacity for participation in research. Although this was a time-intensive approach, it was shown to be a successful and ethically robust solution to this challenge. As 14% of individuals assessed were deemed unable to provide informed consent, this is potentially a costly approach to recruitment, both in terms of finances and time. These challenges should not however act as barriers to research in this area, but should be considered when designing research protocol with people with ID.

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